UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte KIM VILBOUR ANDERSON, MARTIN SCHULEIN, LARS CHRISTIANSEN, BO DAMGAARD, and CLAUS VON DER OSTEN

Appeal No. 2005-0908
Application No. 09/261,329

ON BRIEF

Before WILLIAM F. SMITH, ADAMS, and GREEN, Administrative Patent Judges.

GREEN, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 204-206. Claim 204 is representative of the subject matter on appeal, and reads as follows:

204. A modified cellulase, comprising a substitution of the amino acid at position 119 with H in the amino acid of SEQ ID NO: 5, wherein each position is numbered according to the amino acid sequence of the cellulase of SEQ ID NO: 1 and the modified cellulase has endoglucanase activity.

The examiner relies upon no prior art.

Claims 204 and 206 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably covey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention, i.e., lack of adequate written description. Claims 204 and 206 also stand rejected under 35 U.S.C. § 112, first paragraph, on the grounds that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with the claims. Finally, claims 204-206 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that appellants regard as the invention. After careful review of the record and consideration of the issues before us, we reverse all of the rejections of record.

DISCUSSION

Claims 204 and 206 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably covey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention, i.e., lack of adequate written description.

According to the rejection, the use of "comprising" "allows for an undefined number of substitutions in addition to Q119H and reads on any structure that is not necessarily homologous with SEQ ID NO: 5." Examiner's Answer, page 3.

The examiner asserts further that "[t[he specification teaches the structure of only a single representative species of said genus, the modified endoglucanase from *Thielavia terrestris* having the sequence of SEQ ID NO:5 with the single substitution Q118H corresponding to the substitution Q119H in SEQ ID NO:1." Id. The genus encompassed by the claims, however, according to the examiner, "comprises variants additionally mutated at any of said 200 amino acid residues," and that "the specification fails to describe any other representative species by any identifying characteristics or properties other than the functionality of being a modified cellulase having endoglucanase activity." Id. at 4. The examiner concludes "[g]iven this lack of description of representative species encompassed by the genus of claims, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that applicants were in possession of the claimed invention."

The burden is on the examiner to set forth a prima facie case of unpatentability. See In re Glaug, 283 F.3d 1335, 1338, 62 USPQ2d 1151, 1152 (Fed. Cir. 2002). The Court of Appeals for the Federal Circuit, our reviewing court, has addressed the issue of what constitutes adequate written description for claims drawn to a sequence. In Enzo Biochem, Inc. v. Gen-Probe Inc., 296

F.3d 1316, 63 USPQ2d 1602 (Fed. Cir. 2002), the court adopted a portion of the Guidelines proffered by the United States Patent and Trademark Office (USPTO). The court stated that:

> The written description requirement can be met by "showing that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics . . . i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of characteristics.

Enzo Biochem, 296 F.3d at 1324, 63 USPQ2d at 1613 (citations omitted).

As an initial matter, we would like to address the construction of claim 204. The claims recites "[a] modified cellulase, comprising a substitution of the amino acid at position 119 with H in the amino acid of SEQ ID NO: 5, wherein each position is numbered according to the amino acid sequence of the cellulase of SEQ ID NO: 1 and the modified cellulase has endoglucanase activity." We construe the claim as requiring starting with a cellulase of SEQ ID NO: 5, in which the amino acid at position 119 has been replaced with H, but also encompassing other modifications to the sequence, wherein the modifications may be substitutions, insertions or deletions, with the proviso that the resulting cellulose have endoglucanase activity.[1]

As to the merits of the rejection, Appellants argue that the specification provides "a precise definition by structure of the genus of modified cellulases

sufficient to distinguish it from other modified cellulases" as well as "a description of numerous representative members of the genus, in sufficient detail so that one of skill in the art would recognize that Applicants had invented the claimed subject matter." Appeal Brief, page 5. We agree, and the rejection is reversed.

First, as to function, the claims require that the cellulase have endoglucanase activity. The examiner does not argue, however, that the specification does not describe the functional characteristics or how to determine those characteristics.

Second, as to structure, the claims are drawn to a modified cellulase, wherein the parent cellulase is the cellulase of SEQ ID NO:5, and wherein the amino acid at position 119, wherein each position is numbered according to the cellulase of SEQ ID NO:1, is substituted with a histidine. The examiner contends that "[b]ecause 'comprising' is open language, and the claim allows for an undefined number of substitutions in addition to Q119H, [it thus] reads on any structure that is not necessarily homologous with SEQ ID NO: 5." Examiner's Answer, page 3. As noted above with respect to the construction of the claim, however, the claim requires that the skilled practitioner start with a cellulose having the sequence of SEQ ID NO: 5. Moreover, that statement ignores the limitation that the modified cellulose has endoglucanase activity—thus the claim

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[1] We note also that the examiner required appellants to elect a single disclosed species for prosecution on the merits. See Paper No. 21. Appellants elected with traverse the cellulose of SEQ ID NO: 5, mutated at the position corresponding to position 119 in SEQ ID NO: 1. The rejections under 35 U.S.C. § 112, first paragraph, for lack of adequate written description and lack of enablement appear to be applicable to the genus, and not merely the elected species. Upon return of the application, the examiner should clarify the subject matter that has been examined, not only for purposes of 35 U.S.C. § 112, first paragraph, but also as to the prior art.

sets forth complete or partial structure, i.e. SEQ ID NO. 5 coupled with disclosed correlation with function, i.e., endoglucanase activity. See Enzo Biochem, 296 F.3d at 1324, 63 USPQ2d at 1613. The examiner argues further that the specification teaches the structure of only a single representative species of the genus encompassed by the claims, but, as noted by appellants, see Appeal Brief, page 5, the specification provides examples of mutations in tables 4-6 found at pages 28-35 of the specification. As the examiner has not supplied any evidence or reasoning why those mutations are not descriptive of the claimed modified cellulose, he has failed to meet his burden of establishing a prima facie case of unpatentability for lack of written description, and the rejection is reversed.

Claims 204 and 206 also stand rejected under 35 U.S.C. § 112, first paragraph, "because the specification, while being enabling for a modified cellulase having endoglucanase activity and the amino acid sequence of SEQ ID NO: 5 with a single substitution corresponding to a substitution Q119H in SEQ ID NO:1 (Q119H substitution), does not reasonably provide enablement for a modified cellulase having endoglucanase activity and an amino acid sequence comprising substitution Q119H and having an undefined percent identity to SEQ ID NO:5." Examiner's Answer, page 4.

According to the rejection, "[t]he state of the art does not allow the predictability of the properties based on the structure," nor does the "specification . . . teach which residues beside the specifically substituted are responsible for the resulting properties of the modified cellulase." Id. at 5. The

examiner contends that as the amino acid sequence of a protein dictates its "structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired properties/activity requires a knowledge of guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of substitution and which are conserved (i.e. expectedly intolerant to substitution), and detailed knowledge of the ways in which the proteins' structure relates to its function." Id. at 5-6. But, the examiner asserts, the disclosure is limited to a single modified cellulase. See id. at 6.

The examiner further argues that "[w]hile recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions . . . and the positions within a protein's sequence where amino acid substitutions can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such substitutions is unpredictable." Id. (emphasis in original). Moreover, according to the rejection, the tolerance for substitutions decreases as the number of substitutions increases. See id.

The rejection concludes:

> The specification does not teach a rational and predictable scheme for substituting any residues in SEQ ID NO:5 with an expectation of obtaining the endoglucanase function that is exhibited by a disclosed mutant and the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.
>
> Therefore, on skilled in the art would require guidance beyond that provided in the specification as to how to make a modified cellulase having endoglucanase activity with the amino

> acid sequence of an unknown homology to SEQ ID NO:5. Without such guidance, the experimentation left to those skilled in the art is undue.

Id.

Appellants argue that the specification discloses a large number of modified cellulases and "illustrates how the cellulases are made and used." Appeal Brief, page 9. We agree.

"[A] specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support." In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971) (emphasis in original). "[It] is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain why it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement." Id. at 224, 169 USPQ at 370.

The examiner argues that the specification teaches the structure of only a single representative species of the genus encompassed by the claims, but, as noted above, the specification provides examples of mutations in tables 4-6 found at pages 28-35 of the specification. The examiner does not supply any

evidence or reasoning why the specification does not enable those disclosed mutations.

Moreover, the claims require that the modified enzyme have endglucanase activity. The examiner again does not provide any evidence that one skilled in the art would not be able to test for that activity. Here, the examiner has not provided "acceptable evidence or reasoning which is inconsistent" with the specification, and therefore has not met the initial burden of showing nonenablement, and the rejection is reversed.

Finally, claims 204-206 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that appellants regard as the invention.

According to the rejection:

> Claims 204-206 are drawn to a modified cellulase comprising a substitution Q199H "in the amino acid SEQ ID NO:5, wherein each position is numbered according to the amino acid sequence of the cellulase of SEQ ID NO:1". It is confusing to define a position number in one specific sequence (SEQ ID NO:5) using another sequence (SEQ ID NO:1) as opposed to the direct numbering the position in SEQ D NO:5. It is unclear what limitation is imposed on the scope of the claims by using said indirect numbering via SEQ ID NO:1. The specification discloses the alignment of SEQ ID NOs: 1 and 5 (pages 7-12, Table 1, columns 1 and 5, respectively). SEQ ID NO:1 has 202 amino acids whereas SEQ ID NO:5 has 201 amino acids. As shown in Table 1, SEQ ID NO:5 does not have an amino acid at the position corresponding to position 49 of SEQ ID NO:1. Thus, <u>position Q118 in SEQ ID NO:5 corresponds to position Q119 in SEQ ID NO:1</u>.

Examiner's Answer, page 7 (emphasis in original).

"The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification." Miles Laboratories, Inc. v. Shandon, Inc., 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993). Claims are in compliance with 35 U.S.C. § 112, second paragraph, if "the claims, read in light of the specification, reasonably apprise those skilled in the art and are as precise as the subject matter permits." Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1987).

Here, it is clear from the rejection that the examiner understands the bounds of the claim and understands which amino acid is being substituted. Moreover, as also noted by the examiner, the numbering system is explicitly set forth in Table 1 of the specification. Thus, one skilled in the art would understand the bounds of the claims, and the rejection is reversed.

The rejection further stated that "claim 206 is further confusing as reciting positions 21a, 49a, 49b, 95j and 150b. Neither SEQ ID NO: nor SEQ ID NOI:5 has these positions (Table 1)." Examiner's Answer, page 7.

We initially note that appears to be a new ground of rejection that was not designated as such, and as such, was improper. See 37 CFR § 41.39 (effective September 13, 2004). Be that as it may, however, we agree with appellants that

the lettering is adequately explained at page 6 and in Table 1 of the specification, see Reply Brief, page 1, and the rejection is reversed.

CONCLUSION

Because the examiner has failed to set forth a prima facie case of unpatentability under any of 35 U.S.C. § 112, first paragraph, written description, 35 U.S.C. § 112, first paragraph, scope of enablement, or 35 U.S.C. § 112, second paragraph, all of the rejections of record are reversed.

REVERSED

William F. Smith)
Administrative Patent Judge)
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Donald E. Adams) BOARD OF PATENT
Administrative Patent Judge)
) APPEALS AND
)
Lora M. Green) INTERFERENCES
Administrative Patent Judge)

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